

REMARKS

Claims 1-14 are now in the application. Claim 1 has been amended to include recitations from claims 2, 4 and 5. The amendment to claim 2 finds support on page 4, line 1 of the specification. Newly presented claims 7-14 find basis for instance in the originally filed claims

The amendments to claims and newly presented claims do not introduce any new matter.

Claims 1-4 were rejected under 35 USC 102(b) and under 35 USC 103(a) over Mano (JP 2002-253,703). Mano does not anticipate and does not render obvious the present claims.

The office action refers to entry one of Table 1 of Mano. In addition, the office action relied upon Table 1 in U.S. Patent 5,082,285 to Hamada et al. to demonstrate a high cis-polybutadiene commercially available as BR-11; $M_n = 100,000$. Also referred to is U.S. Patent 5,462,680 to Boris et al. as evidence to free radical adducts of fullerenes being known in the art.

The present invention is concerned with the use of the modified conjugated diene-based polymer, together with a rubber component and a reinforcing filler, in the rubber composition. The modified conjugated diene-based polymer is synthesized by reacting the growing terminal anions formed by an anion polymerization of the conjugated diene-based polymer with a fullerene. The amount of the fullerene bonded to the terminal end of the modified conjugated diene-based polymer is 0.001 to 2 molecules per one molecular chain of the modified conjugated diene-based polymer.

Contrary to the above, Mano suggests a golf ball obtained from a rubber composition containing (a) 100 parts by weight of a base rubber, (b) 15 – 45 parts by weight of a co-crosslinking agent, (c) 0.2 – 5 parts by weight of an organic peroxide and (d) 0.05 – 3 parts by weight of a fullerene or its derivative.

However, although the fullerene is suggested in the rubber composition in JP 2002-253,703, the fullerene is merely compounded in the rubber composition of JP 2002-253,703, unlike the present invention. As mentioned above, according to the present invention, the

fullerene is bonded to the growing terminal anions of the conjugated diene-based polymer. According to the cited invention, the fullerene is attached to any portions of the polymer chain by the action of the organic peroxide to the polymer chain. It is very seldom that the organic peroxide attacks the terminal portion of the polymer.

Thus, the structure of the resultant modified polymer of Mano is completely different from that of the present invention. In addition, since the co-crosslinking agent is present in the cited composition, the crosslinking of the polymer chains via the attached fullerene also occurs therein.

This is not the case in the present invention. Consequently, the present invention is neither disclosed nor taught in Mano (JP 2002-253,703).

Mano fails to anticipate the present invention. In particular, anticipation requires the disclosure, in a prior art reference, of each and every recitation as set forth in the claims. See *Titanium Metals Corp. v. Banner*, 227 USPQ 773 (Fed. Cir. 1985), *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 1 USPQ2d 1081 (Fed. Cir. 1986), and *Akzo N.V. v. U.S. International Trade Commissioner*, 1 USPQ2d 1241 (Fed. Cir. 1986).

There must be no difference between the claimed invention and reference disclosure for an anticipation rejection under 35 U.S.C. 102. See *Scripps Clinic and Research Foundation v. Genetech, Inc.*, 18 USPQ2d 1001 (CAFC 1991) and *Studiengesellschaft Kohle GmbH v. Dart Industries*, 220 USPQ 841 (CAFC 1984).

Claims 1-6 were rejected under 35 USC 103(a) as being unpatentable over US Patent 5,750,615 to Lukich et al. (hereinafter also referred to as “Lukich”). Lukich does not render obvious the present claims. The office action refers to column 2, lines 17-20 of Lukich for disclosures that fullerenes may have surface modifications such as a functional group substitution to enhance reinforcement properties. The Examiner recognized in the office action that the working examples of Lukich et al. do not show the ultimate embodiment of compositions containing functionalized fullerene but concluded that such would have been obvious. A footnote in the office action refers to U.S. Patents 5,087,668 to Sandstrom et al. and U.S. Patent

3,960,980 to Yakuta et al. in asserting use of diene-based elastomer having M_w above the claimed minimum in a tire formulation.

Lukich suggests a tire obtained from a rubber composition comprised of (A) 100 parts by weight (phr) of a diene-based elastomer and (B) 30 – 100 phr of the elastomer reinforcement composed of 5 – 100 wt% of fullerene carbon and 0 – 95 wt% of carbon black or silica.

However, the present invention clearly differs from the Lukich in the following points:
(a) the fullerene carbon used in the Lukich is not bonded to the terminal portion of the conjugated diene-based polymer, as is according to the present invention.

According to the present invention, the modified conjugated diene-based polymer is synthesized by reacting the growing terminal anions formed by an anion polymerization of the conjugated diene-based polymer with a fullerene. The amount of the fullerene bonded to the terminal end of the modified conjugated diene-based polymer is 0.001 to 2 molecules per one molecular chain of the modified conjugated diene-based polymer.

According to the present invention, compositions are preferred that are capable of exhibiting excellent processability, superior because between the moldules and heat buildup, excellent cold flowability and superior tan δ balance with a low tan δ value at 60°C and high tan δ value 0°C.

According to Lukich the fullerene is merely used as a reinforcing agent in the rubber composition in place of at least a portion of carbon balck (see the Abstract, etc.). Consequently, the present invention is not rendered obvious by Lukich et al.

With respect to non-obvious, the cited art lacks the necessary direction or incentive to those or ordinary skill in the art to render a rejection under 35 USC 103 sustainable. The cited art fails to provide the degree of predictability of success of achieving the properties attainable by the present invention needed to sustain a rejection under 35 USC 103. See *KSR Int'l Co. v. Teleflex, Inc*, 127 S.Ct. 1727; 82 USPQ2d 1385 (2007), *Diversitech Corp. v. Century Steps, Inc.*

7 USPQ2d 1315 (Fed. Cir. 1988), *In re Mercier*, 187 USPQ 774 (CCPA 1975) and *In re Naylor*, 152 USPQ 106 (CCPA 1966).

Moreover, the properties of the subject matter and improvements which are inherent in the claimed subject matter and disclosed in the specification are to be considered when evaluating the question of obviousness under 35 USC 103. See *Gillette Co. v. S.C. Johnson & Son, Inc.*, 16 USPQ2d. 1923 (Fed. Cir. 1990), *In re Antonie*, 195, USPQ 6 (CCPA 1977), *In re Estes*, 164 USPQ 519 (CCPA 1970), and *In re Papesch*, 137 USPQ 43 (CCPA 1963).

No property can be ignored in determining patentability and comparing the claimed invention to the cited art. Along these lines, see *In re Papesch*, supra, *In re Burt et al*, 148 USPQ 548 (CCPA 1966), *In re Ward*, 141 USPQ 227 (CCPA 1964), and *In re Cescon*, 177 USPQ 264 (CCPA 1973). In view of the above, consideration and allowance are respectfully solicited.

In the event the Examiner believes an interview might serve in any way to advance the prosecution of this application, the undersigned is available at the telephone number noted below.

A two-month extension of time fee is due with this response. The Commissioner is hereby authorized in this, concurrent, and further replies, to charge payment or credit any overpayment to Deposit Account No. 22-0185, under Order No. 21713-00055-US1 from which the undersigned is authorized to draw.

Dated: August 16, 2007

Respectfully submitted,

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